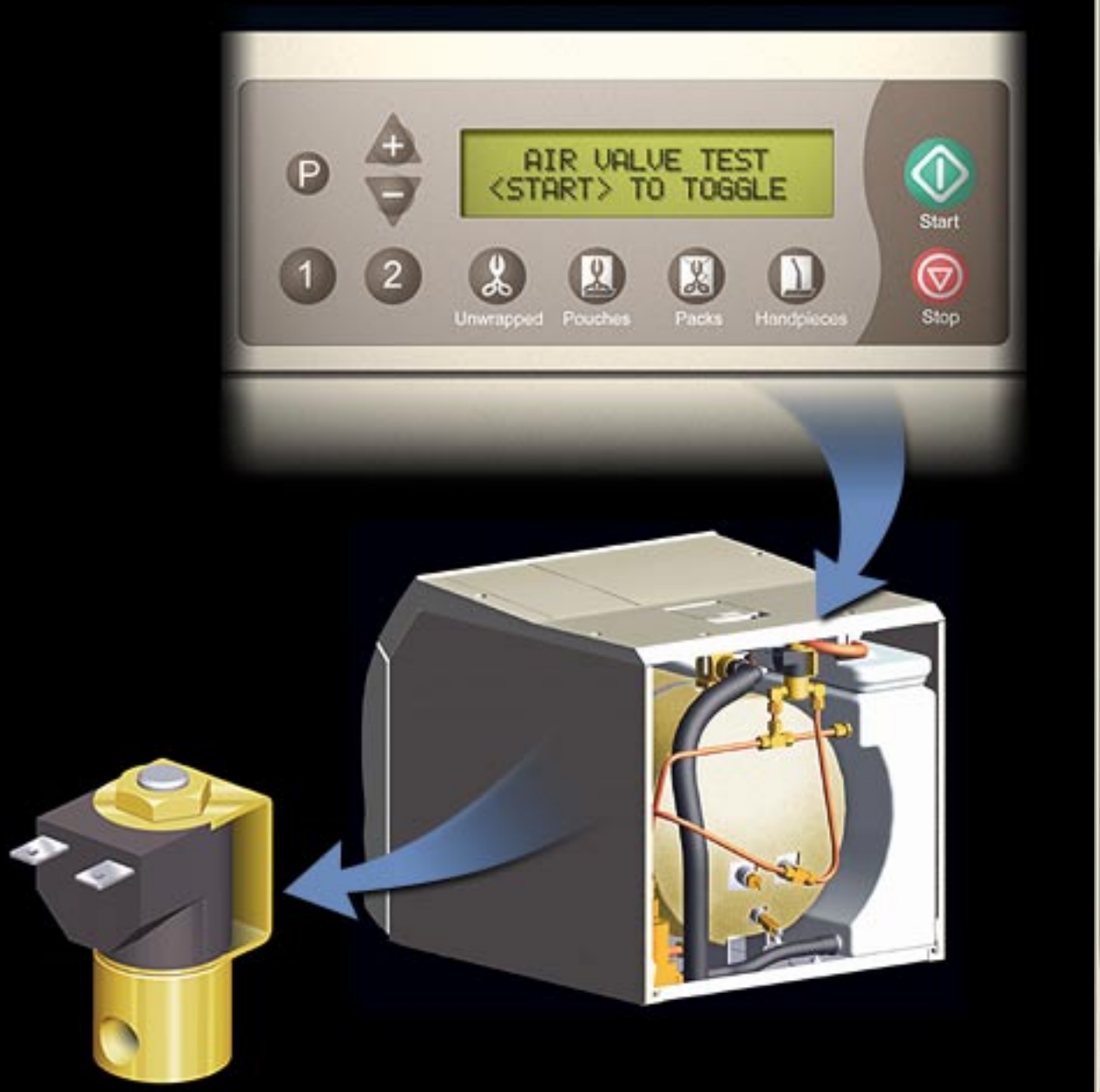
Service Diagnostics Mode



The Service Diagnostics Mode allows you to perform test procedures using the touch pad.

These procedures enable you to view recent error codes and test the sterilizer's major components without running a complete cycle.

The tests in the Service Diagnostics Mode should <u>always</u> be done before replacing any major component.

CAUTION

This operation requires power to be connected to the unit with the panels removed. Use caution when performing this procedure.

For detailed information about the location and function of any component shown, simply click on that component.

Print | Error Codes | Next

MIDMARK

Disconnect Power

To begin...

A. Disconnect power to the unit. (Click on power cord)

Print | Error Codes | Back

MIDMARK

Remove Panel

ISA107800

To begin...

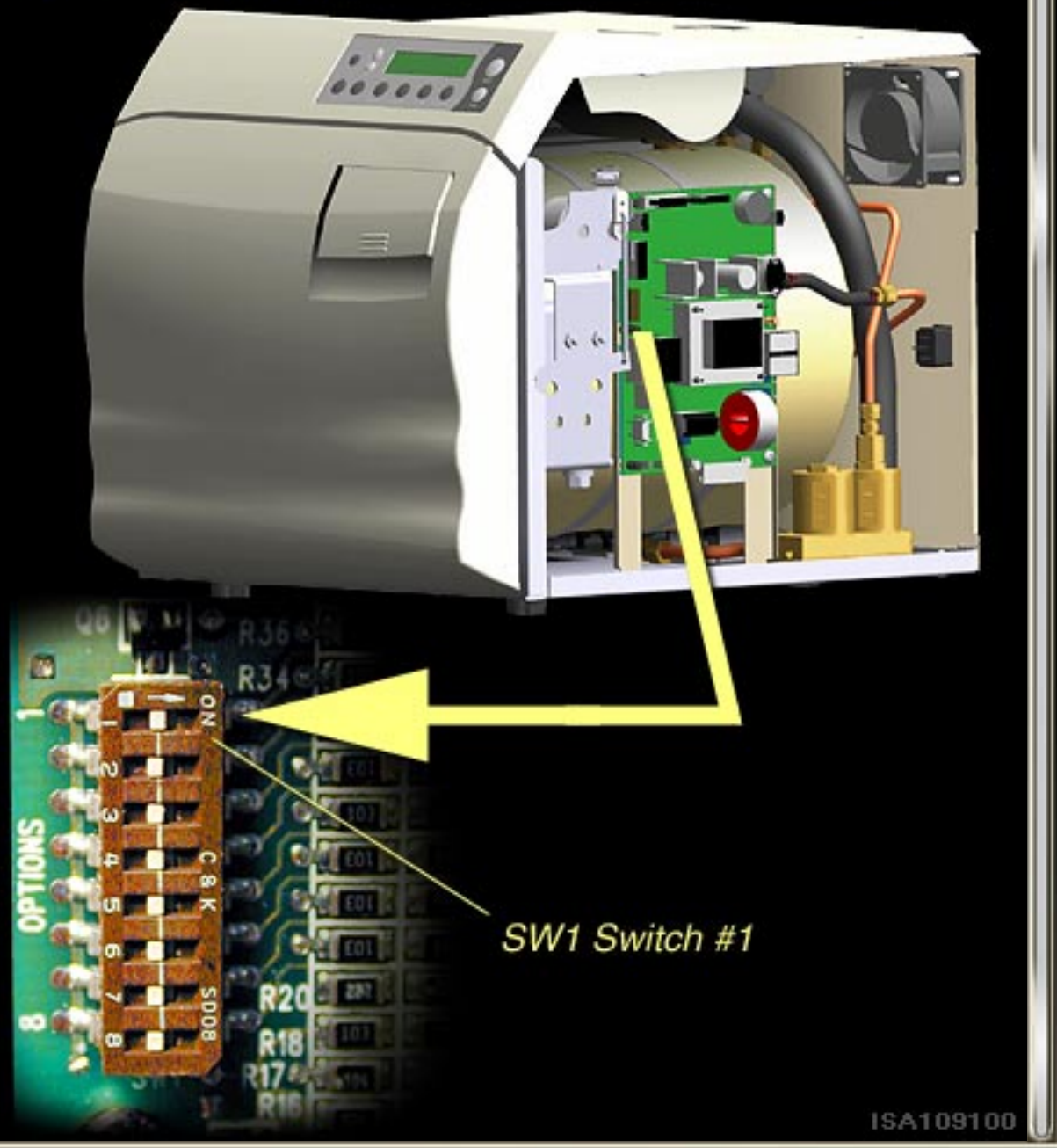
A. *Disconnect power to the unit.*

B. ***Remove the right side panel.*** ***(Click on side panel)***

Print | Error Codes | Back

MIDMARK

Turn SW1 Switch #1 On



To begin...

A. Disconnect power to the unit.

B. Remove the right side panel.

C. Move switch #1 on the SW1 block of main PC board, to the ON position.
(Click on switch #1)

Print | Error Codes | Back

MIDMARK

Reconnect Power

ISA109200

To begin...

A. Disconnect power to the unit.

B. Remove the side and rear panels.

C. Move switch #1 on the SW1 block of main PC board, to the ON position.

D. Reconnect power to the unit. (Click on power cord)

Print | Error Codes | Back

MIDMARK

ISA103500

The display panel will show:

- Total number of cycles run on the sterilizer *(ex. 15)*
- Model number *(ex. M11)*
- Software version number *(ex. v2.00)*

MIDMARK

Press the START button.

ISA103700

Print | Error Codes | Back

MIDMARK

Test Selection Screen

Pressing the START button initiates the *I/O Test*. This test allows you to energize the Air Valve, Vent Valve, Fill Valve, Door Motor, and Heating Element independently, without running a cycle.

This test also shows the temperature and pressure inside the chamber, and the status of the High-Limit Thermostats, the Door Switch, and the Water Level Sensor.

Pressing the STOP button will show the last five error codes displayed on the unit.

Pressing the HANDPIECES button will initiate the *Keytest.* This test allows you to check the functionality of the buttons on the touch pad.

I/O Test
Air Valve

Air Valve is CLOSED
(not energized)

ISA104300

Pressing the START button energizes the Air Valve. This causes it to open.

You will hear an audible click when the Air Valve opens. This indicates the PC board and the Air Valve are functioning properly.

Press the START button.

Print | Error Codes | Back

MIDMARK

I/O Test
Air Valve

Air Valve is OPEN
(energized)

Pressing the START button again closes the valve.

Press the START button.

ISA104800

Print | Error Codes | Back

MIDMARK

I/O Test
Air Valve

Air Valve is CLOSED
(not energized)

Press the STOP button to test the next component.

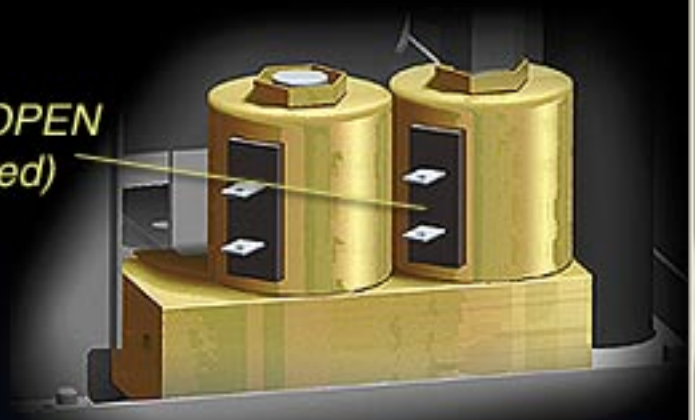
ISA104400

Print | Error Codes | Back

MIDMARK

I/O Test
Vent Valve

Vent Valve is OPEN
(not energized)



ISA104500

Pressing the START button energizes the Vent Valve. This causes it to close.

You will hear an audible click when the Vent Valve is energized. This indicates the PC board and the Vent Valve are functioning properly.

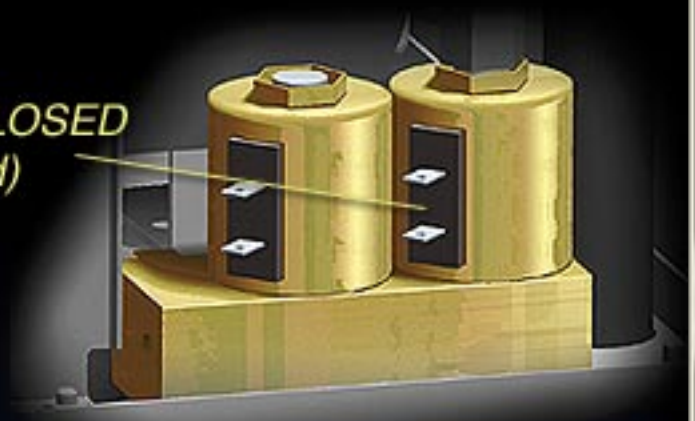
Press the START button.

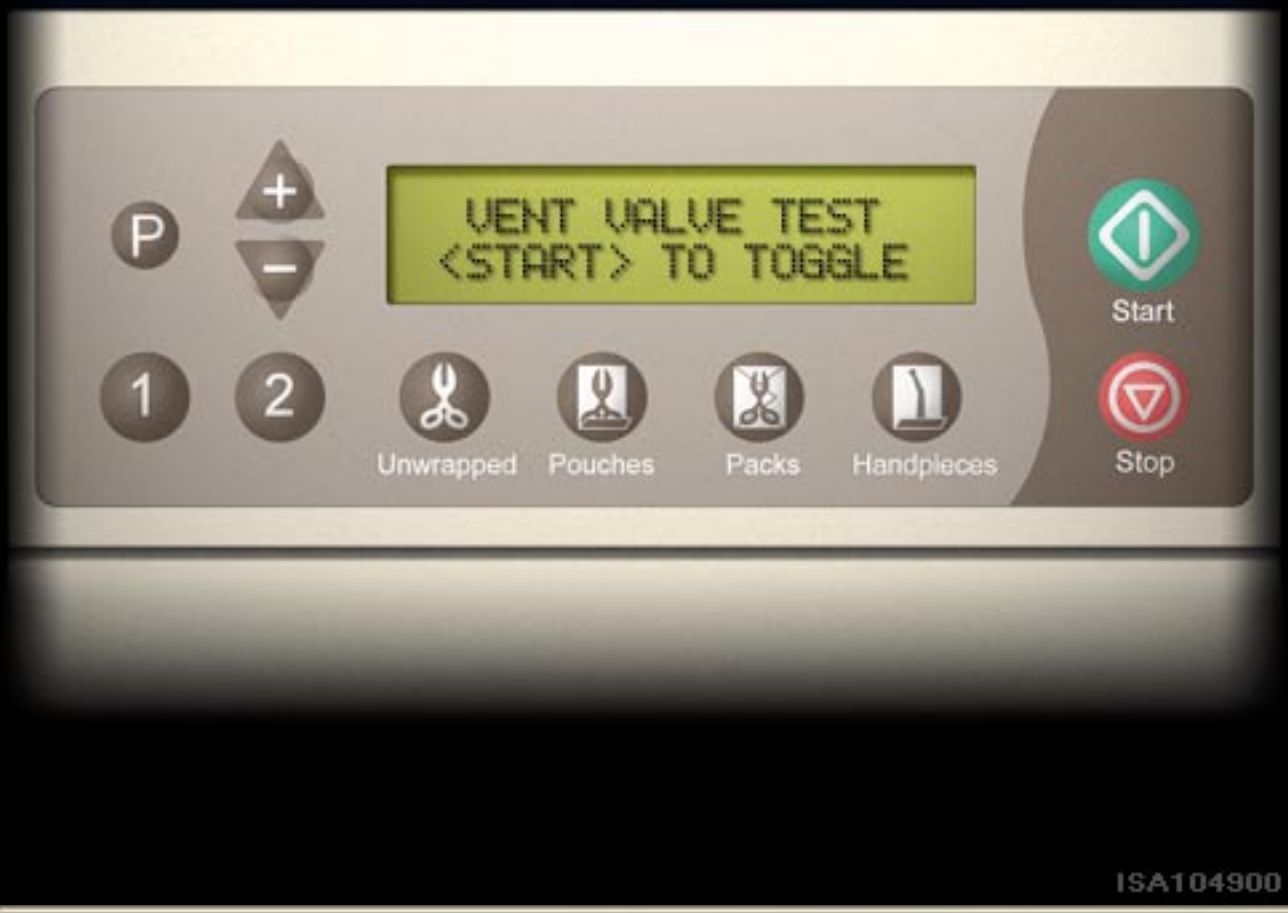
Print | Error Codes | Back

MIDMARK

I/O Test
Vent Valve

Vent Valve is CLOSED (energized)





ISA104900

Pressing the START button again, opens the valve.

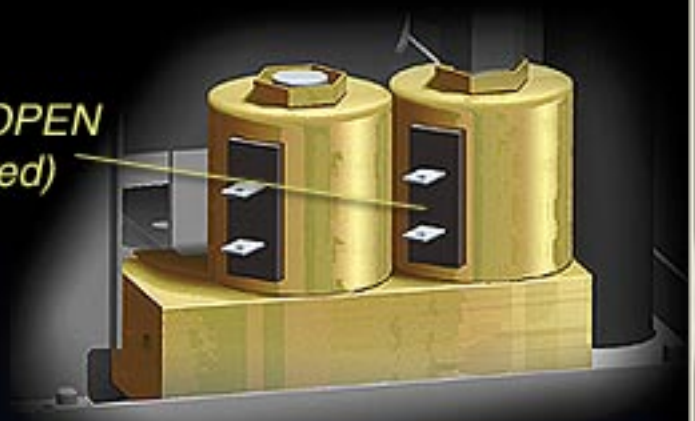
Press the START button.

Print | Error Codes | Back

MIDMARK

I/O Test
Vent Valve

Vent Valve is OPEN
(not energized)



Press the STOP button to test the next component.

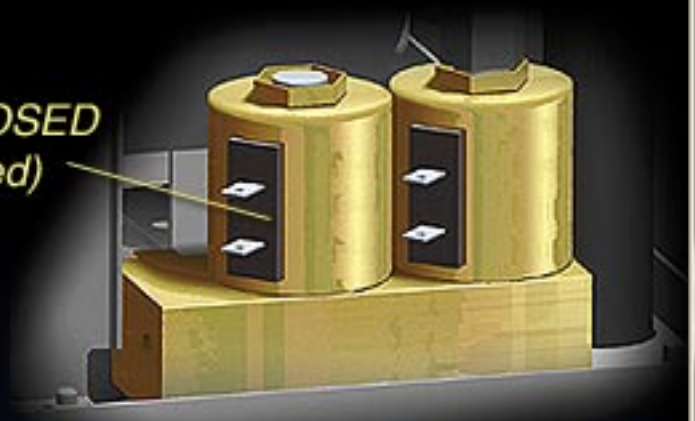
ISA104600

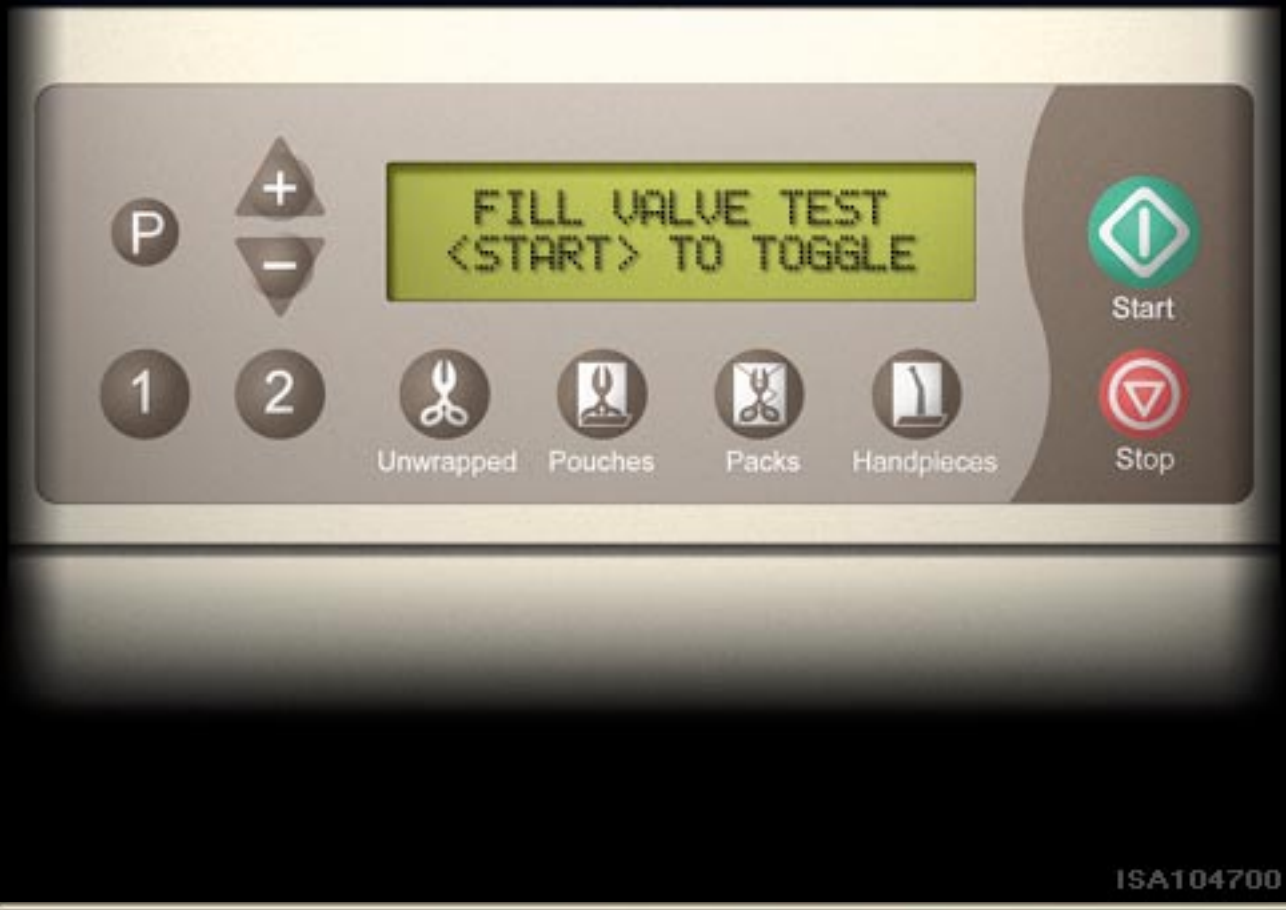
Print | Error Codes | Back

MIDMARK

I/O Test
Fill Valve

Fill Valve is CLOSED (not energized)





ISA104700

NOTE
The door switch must be tripped to perform the Fill Valve Test. Close the door, or trip the switch manually during this procedure.

Pressing the START button, energizes the Fill Valve. This causes it to open. When the Fill Valve is open, water flows into the chamber.

ATTENTION
The water level sensor does not function during this test. If the Fill Valve is left open too long, the chamber will overflow.

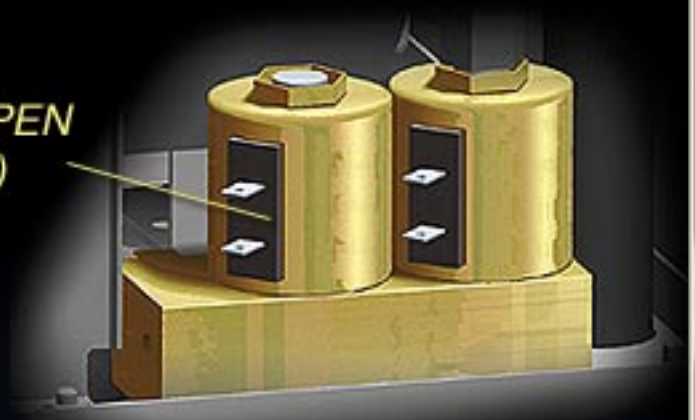
Press the START button.

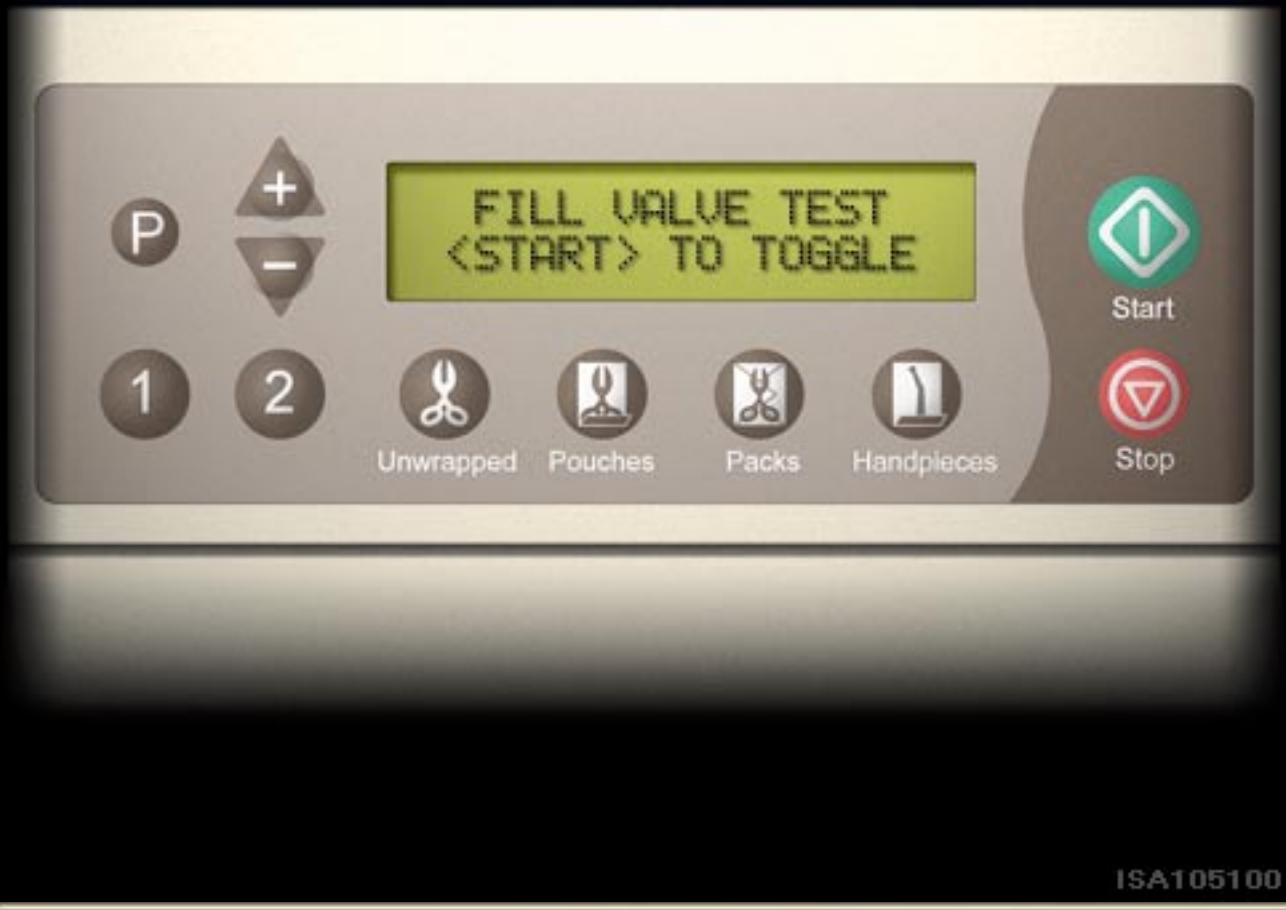
Print | Error Codes | Back

MIDMARK

I/O Test
Fill Valve

Fill Valve is OPEN (energized)





ATTENTION
The water level sensor does not function during this test. If the Fill Valve is left open too long, the chamber will overflow.

Water entering the chamber indicates that the PC board and Fill Valve are functioning properly.

Pressing the START button again, closes the valve.

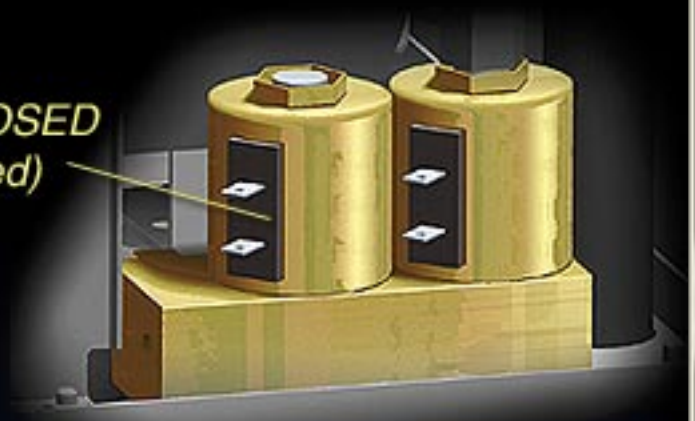
Press the START button.

Print | Error Codes | Back

MIDMARK

I/O Test
Fill Valve

Fill Valve is CLOSED
(not energized)



Press the STOP button to test the next component.

ISA105200

Print | Error Codes | Back

MIDMARK

I/O Test
Door Motor

Door Closed

ISA105400

NOTE
This procedure should be performed with the door closed.

Pressing the START button energizes the Door Motor.

Press the START button.

Print | Error Codes | Back

MIDMARK

I/O Test
Door Motor

Door Open

The door should open after approximately 15 seconds. This indicates the PC board and Door Motor are functioning properly.

Press the STOP button to test the next component.

ISA105500

Print | Error Codes | Back

MIDMARK

I/O Test
Heating Element

Heating Element - OFF

ISA105600

Pressing the START button energizes the Heating Element.

Press the START button.

Print | Error Codes | Back

MIDMARK

I/O Test
Heating Element

Heating Element - ON

ISA105700

The heating element will heat up for approximately 15 seconds, then turn off. This indicates the PC board and Heating Element are functioning properly.

ATTENTION
Do not run this test more than twice without allowing the unit to cool. Doing so may cause the sterilizer to overheat.

Press the STOP button to display the status of the Door Switch, the High-Limit Thermostats, and the Water Level Sensor.

Print | Error Codes | Back

MIDMARK

I/O Test
Status Display

The display shows the status of the High-Limit Thermostats, the Door Switch, and the Water Level Sensor.

The High-Limit Thermostat display appears as *HI-LIM.* The status reflects the position of the contacts in the two thermostats. The status should always be *CLOSED*. (Open contacts indicate the unit has overheated, or that one or both of the thermostats are malfunctioning).

The Door Switch display appears as *DOOR.* The status should correctly reflect the position of the door, *OPEN* or *CLOSED*.

The Water Level Sensor display appears as *FILL.* The status should reflect the amount of water in the chamber. If there is water contacting the water level sensor, the status should be *FULL*, if not, it should be *EMPTY*.

MIDMARK

I/O Test
Status Display

Press the STOP button to display the temperature and pressure in the chamber.

ISA105900

Print | Error Codes | Back

MIDMARK

Temperature & Pressure Display

The display shows the temperature and pressure in the chamber.

WIth the door open, the pressure should appear as 0.0 PSI (0.0 kPa).

The temperature can be verified with a thermometer.

Press the STOP button to go back to the Test Selection Screen.

Recall Errors

The display shows the last five error codes for the unit.

Each digit in the error code provides information about the problem that occurred.

Example: C382

First Digit =Where?
The first digit indicates the component (or system) where the problem occurred.
(ex. 3=Door Switch)

Second Digit =What?
The second digit indicates what problem (or symptom) was detected.
(ex. 8=Open)

Third Digit=When?
The third digit indicates when the problem was detected.
(ex. 2=Fill Mode)

[Click the Error Codes button for Error Code / Component Reference Table]

Print | Error Codes | Back | Next

MIDMARK

Recall Errors

ISA106200

To erase the error codes:
Press the START button.

To retain the error codes:
Press the STOP button.

Print | Error Codes | Back

MIDMARK

Recall Errors

The error codes have been erased from the unit's memory.

Press the STOP button to go back to the Test Selection Screen.

Print | Error Codes | Back

MIDMARK

Key Test

When the designated button is pressed, you will hear a single beep, and the test will advance to the next button. This indicates the button is functioning properly.

Press the START button.

Print | Error Codes | Back

MIDMARK

Key Test

When the designated button is pressed, you will hear a single beep, and the test will advance to the next button. This indicates the button is functioning properly.

Press the STOP button.

Print | Error Codes | Back

MIDMARK

Key Test

When the designated button is pressed, you will hear a single beep, and the test will advance to the next button. This indicates the button is functioning properly.

Press the HANDPIECES button.

Print | Error Codes | Back

MIDMARK

Key Test

When the designated button is pressed, you will hear a single beep, and the test will advance to the next button. This indicates the button is functioning properly.

Press the PACKS button.

Print | Error Codes | Back

MIDMARK

Key Test

When the designated button is pressed, you will hear a single beep, and the test will advance to the next button. This indicates the button is functioning properly.

Press the POUCHES button.

Print | Error Codes | Back

MIDMARK

Key Test

When the designated button is pressed, you will hear a single beep, and the test will advance to the next button. This indicates the button is functioning properly.

Press the UNWRAPPED button.

Print | Error Codes | Back

MIDMARK

Key Test

When the designated button is pressed, you will hear a single beep, and the test will advance to the next button. This indicates the button is functioning properly.

Press the "2" button.

Print | Error Codes | Back

MIDMARK

Key Test

When the designated button is pressed, you will hear a single beep, and the test will advance to the next button. This indicates the button is functioning properly.

Press the "1" button.

Print | Error Codes | Back

MIDMARK

Key Test

When the designated button is pressed, you will hear a single beep, and the test will advance to the next button. This indicates the button is functioning properly.

Press the "P" button.

Print | Error Codes | Back

MIDMARK

Key Test

When the designated button is pressed, you will hear a single beep, and the test will advance to the next button. This indicates the button is functioning properly.

Press the " + " button.

Print | Error Codes | Back

MIDMARK

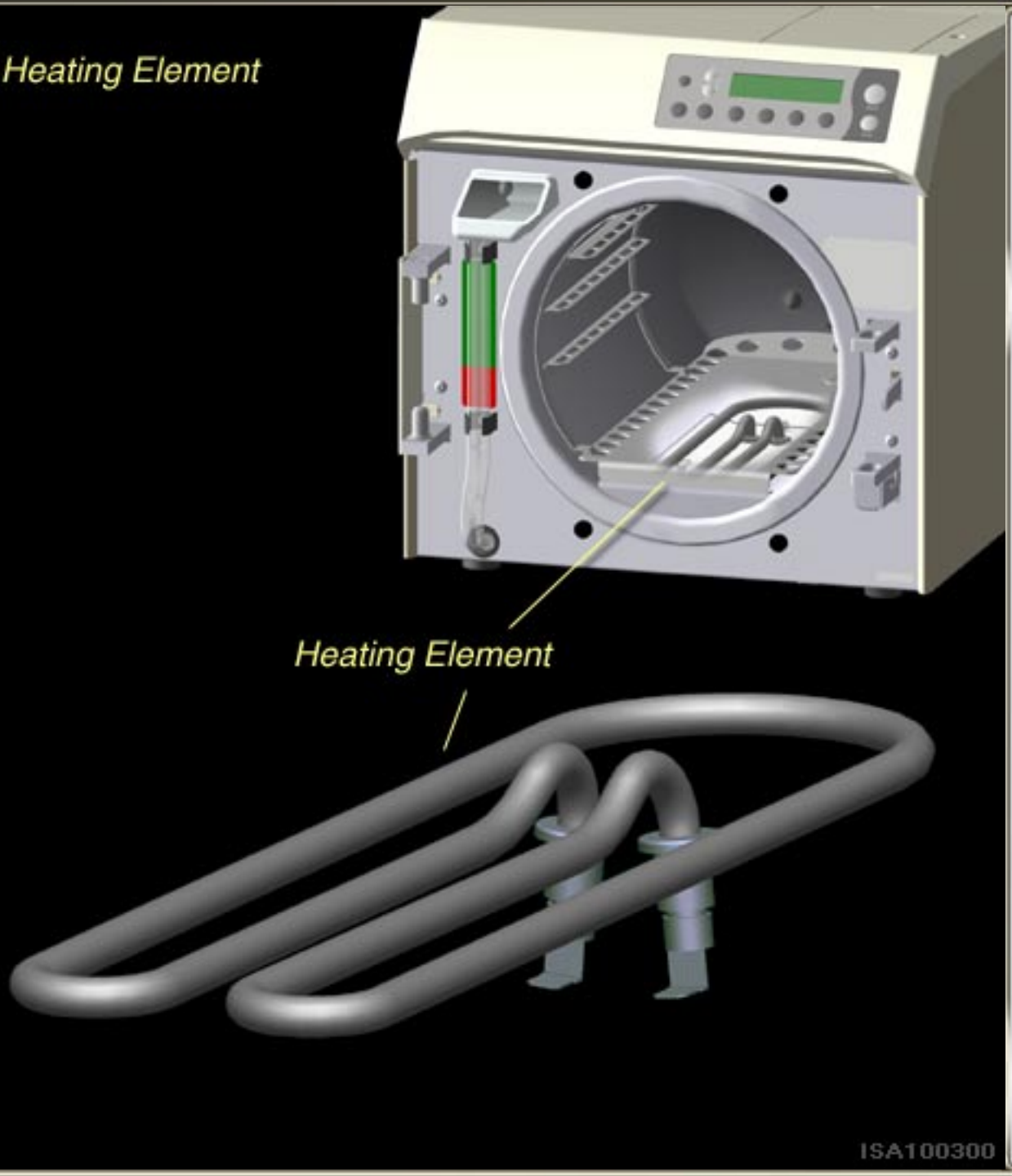
Key Test

When the designated button is pressed, you will hear a single beep. This indicates the button is functioning properly.

Press the " - " button.

Print | Error Codes | Back

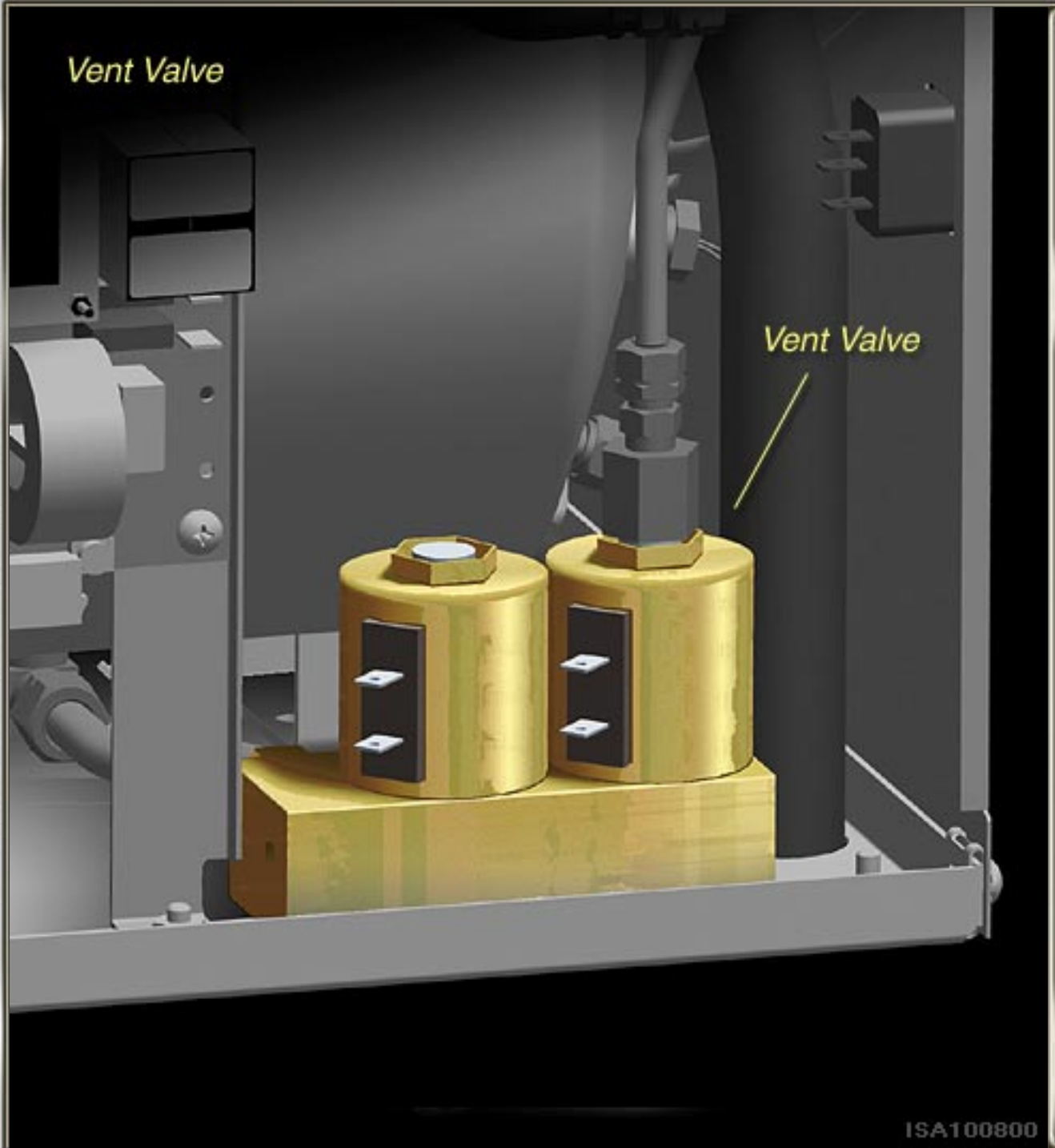
MIDMARK



The submersible Heating Element is located inside the pressure vessel, under the tray plate.

During the Heat-Up, Sterilization, and Dry Modes, the PC board turns the Heating Element ON and OFF to reach and maintain proper chamber conditions.

[Refer to the Components section for resistance test procedure]



The Vent Valve is located on the right side of the unit. This valve is open until it is energized.

During the Filling, Heat-Up, and Sterilization Modes, the PC board supplies line voltage to the Vent Valve. This closes the valve so that pressure can build in the chamber.

In the Vent Mode, the PC board stops the current flow to the Vent Valve. This opens the valve and releases the pressure from the chamber.

Service Tip

Debris flushed through the system can get trapped in the Vent Valve. This may prevent the valve from opening or closing properly. If a faulty Vent Valve is suspected, disassemble the valve and remove any debris.

[Refer to the Components section for resistance test procedure]

The Fill Valve is located on the right side of the unit. This valve is closed until it is energized.

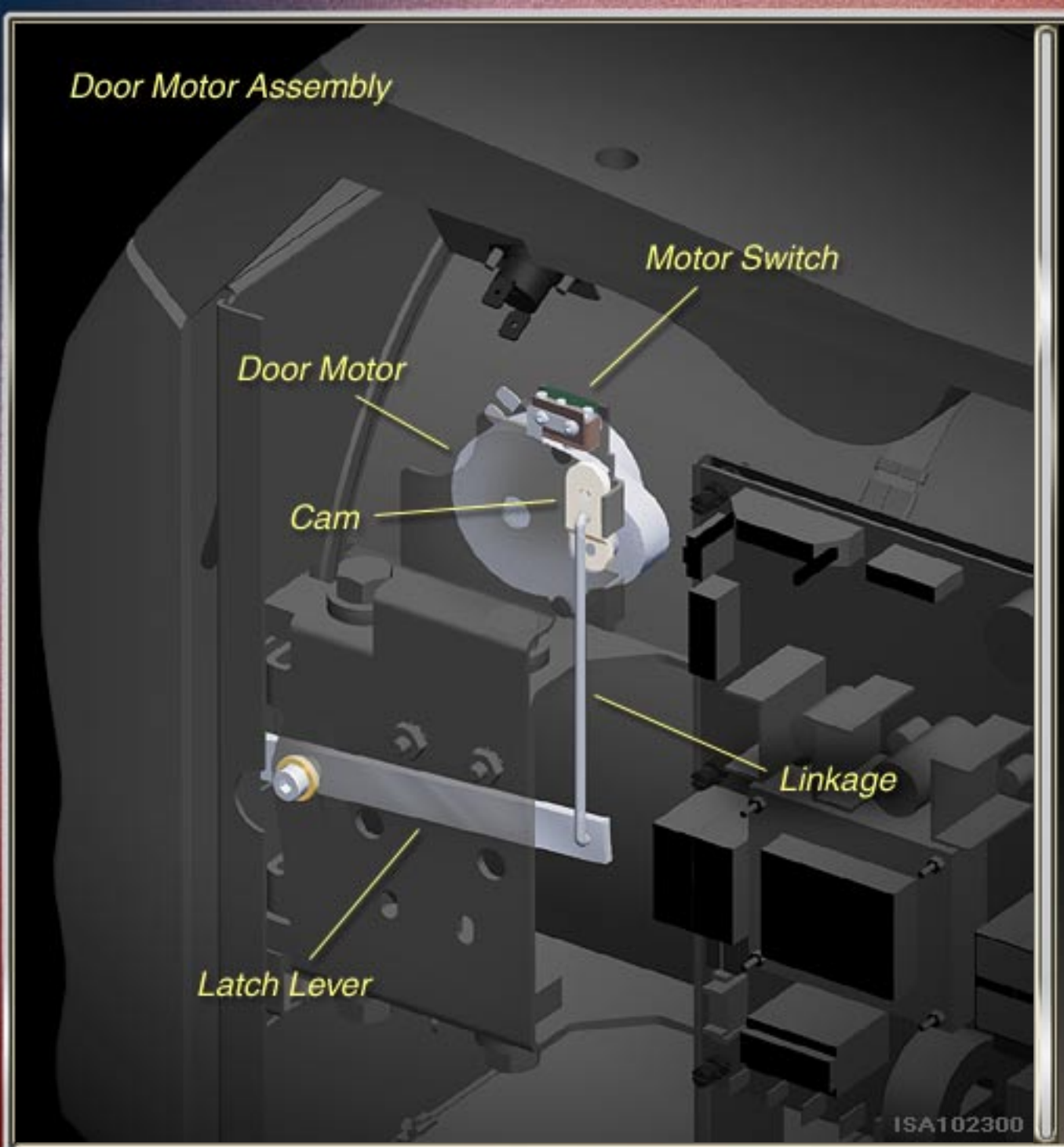
During the Fill Mode, the PC board supplies line voltage to the Fill Valve. This opens the valve, allowing water to flow into the chamber.

When water reaches the water level sensor inside the pressure vessel, a circuit is completed and current flows back to the PC board. When this voltage is detected, the PC board stops the current flow to the Fill Valve. This closes the valve, stopping the flow of water into the pressure vessel.

Service Tip

Debris trapped in the Fill Valve may prevent the valve from opening or closing properly. If a faulty Fill Valve is suspected, disassemble the valve and remove any debris.

[Refer to the Components section for resistance test procedure]

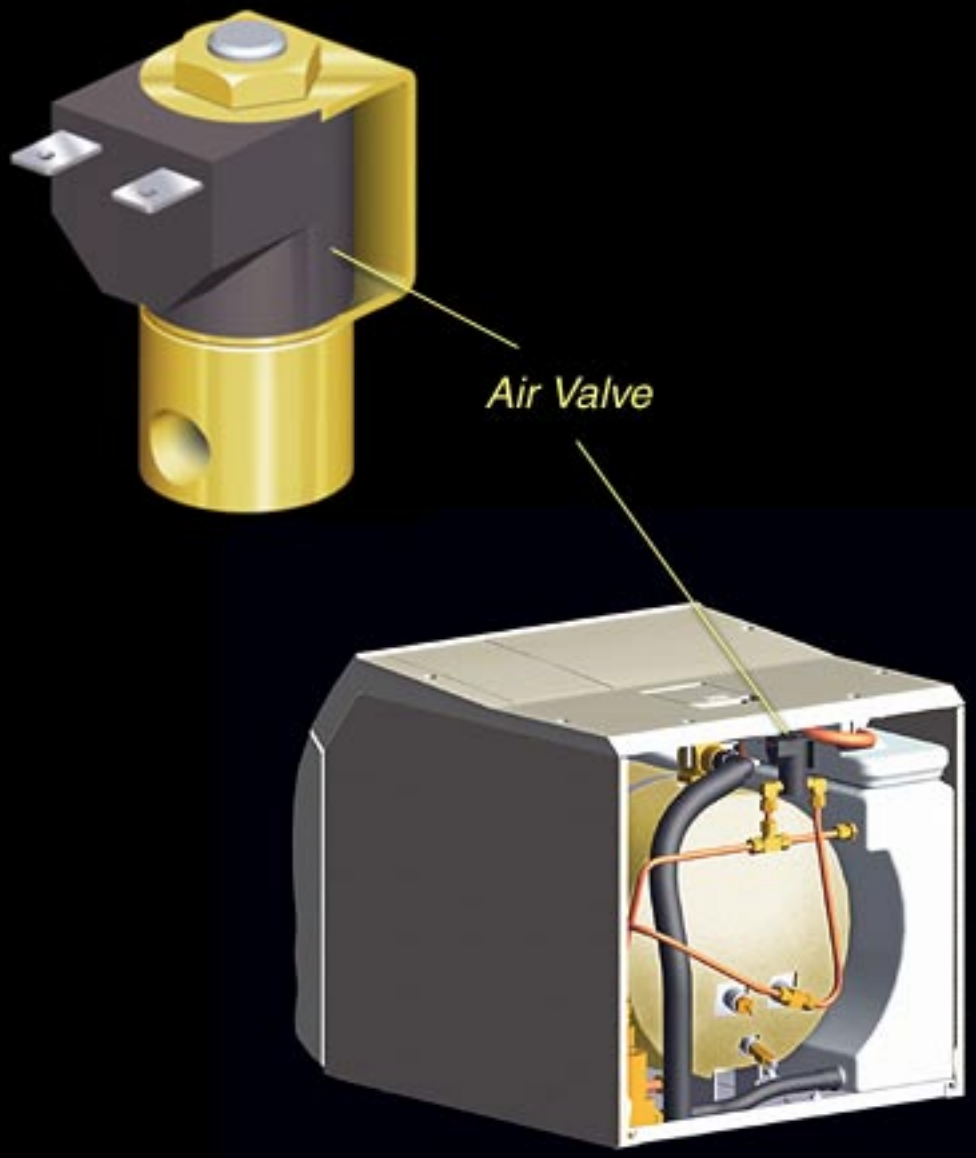


The Door Motor Assembly is located on the right side of the unit. This mechanism automatically opens the door after the Vent Mode.

When the pressure in the chamber reaches 0.7 PSI (5 kPa), the PC board bypasses the Motor Switch and energizes the Door Motor. The Door Motor rotates the Cam causing the Motor Switch to close. Now the current to the Door Motor flows through the Motor Switch. As the Cam rotates, the Linkage causes the Latch Lever to open the door.

When the Cam reaches the bottom of its travel, the motor reverses direction. When the Cam reaches its original position, the Motor Switch opens, stopping the current flow to the Door Motor. This causes the motor to stop running.

[Refer to the Components section for resistance test procedure]



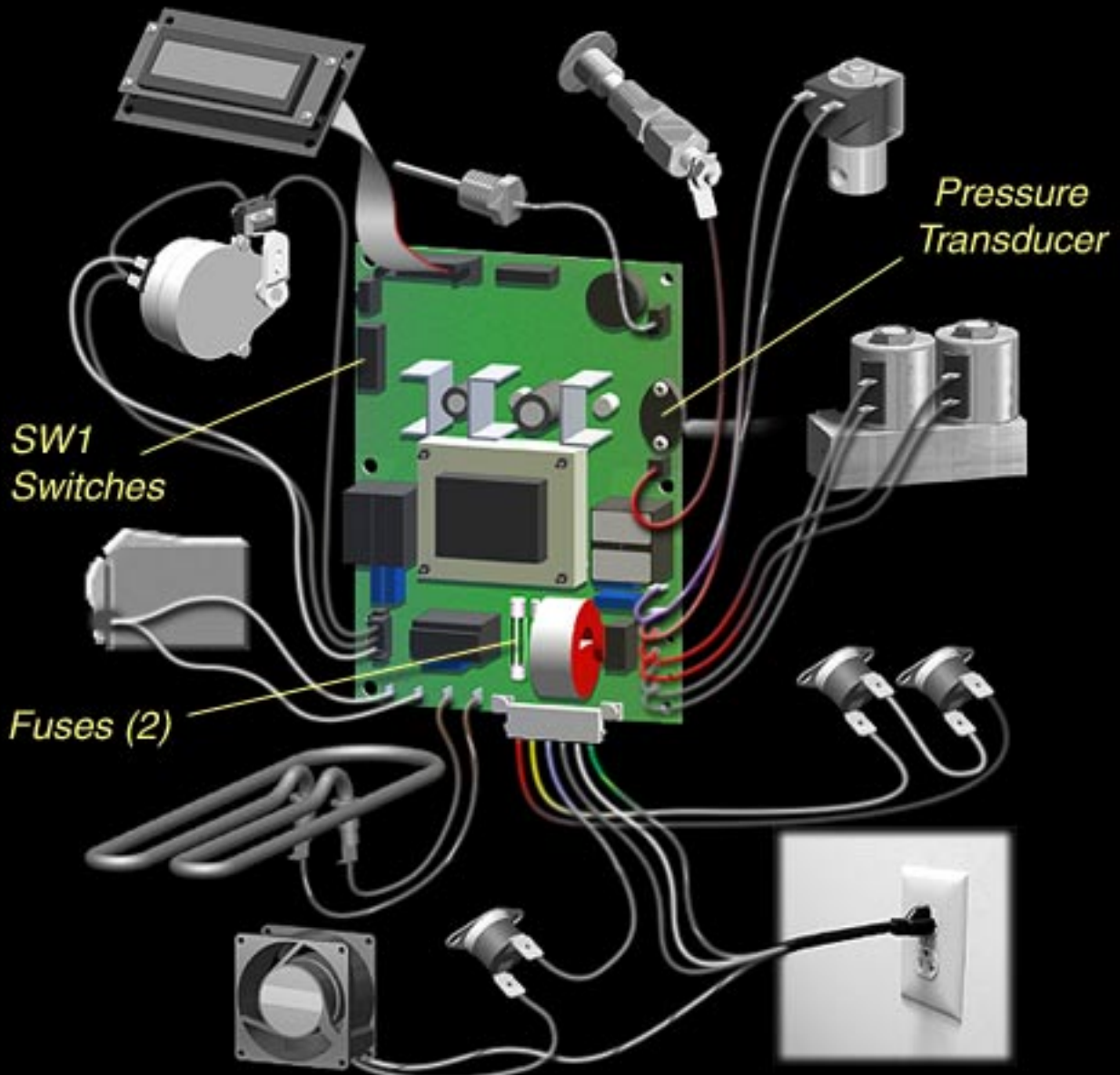
The Air Valve is located in the back of the unit.

During the Fill Mode, the PC board supplies line voltage to the Air Valve. This causes the valve to open so that water can flow into the chamber.

When the Heat-Up Mode begins, the PC board stops the current flow to the Air Valve. This closes the valve. The PC board opens the Air Valve three times during the Heat-Up Mode to release air from the chamber.

During the Sterilization, Vent, and Dry Modes, there is no current flow to the Air Valve. This causes the valve to remain closed.

[Refer to the Components section for resistance test procedure]



The Main PC Board controls all of the electronic components of the sterilizer. During operation, the Pressure Transducer monitors the chamber conditions to maintain the parameters for the selected cycle.

The two Fuses on the PC board (F1 and F2) protect the circuitry from excessive current draw. If either Fuse is faulty, the unit will not operate.

The SW1 Switches can be used for service diagnostic and to adjust the display to metric units.

[Refer to the Components section for test procedures]

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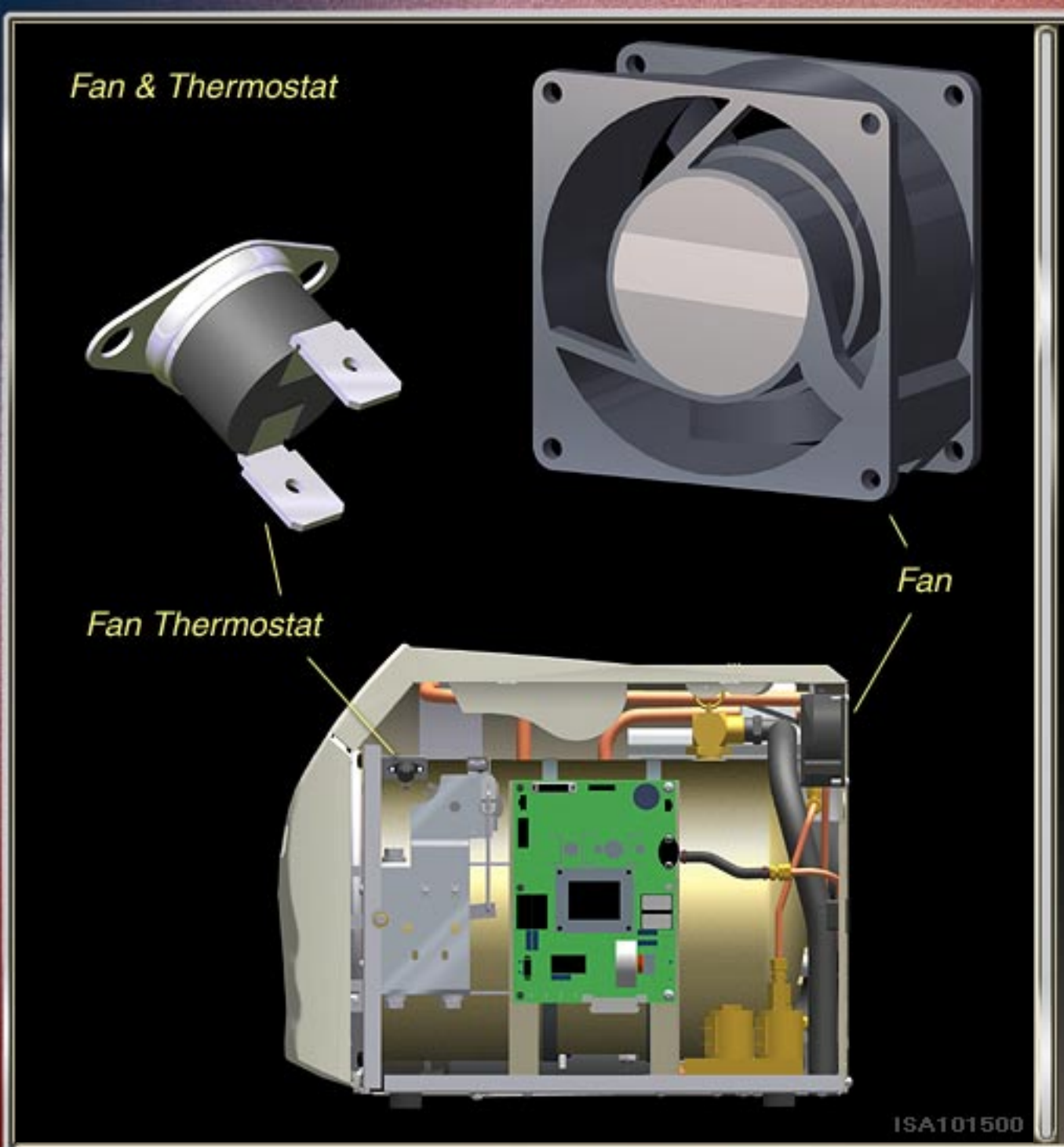
MIDMARK



The Fan is mounted to the back cover of the unit.

The purpose of the Fan is to reduce heat inside the enclosure by circulating air between the chamber and the covers.

The ON / OFF function of the Fan is controlled by the Fan Thermostat. When the temperature reaches 130°F ±8° (54°C ±4°), the Fan Thermostat contacts close and current flows to the Fan. This causes the Fan to run.

When the temperature drops to 101°F ±6° (38°C ±3°), the Fan Thermostat contacts open and the Fan stops running.

[Refer to the Components section for resistance / continuity test procedures]

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MIDMARK

Error Code Reference Table

First Digit=Component	Second Digit=Problem	Third Digit=Mode
0=General System	0 (not used)	0=Power-Up
1=Stop Button	1=Power Loss	1=Select Cycle
2=Water Level Sensor	2=Closed	2=Fill
3=Door Switch	3=Low	3=Heat-Up
4 (not used)	4=High	4=Sterilizing
5=Temperature Sensor	5 (not used)	5=Vent
6=Pressure Sensor	6=Hardware	6="Door To Open"
7 (not used)	7=Over Limit	7=Dry
8 (not used)	8=Open	8 (not used)
9=High-Limit Thermostat(s)	9 (not used)	9 (not used)

Use this table to cross-reference the numeric error code with the *Component*, *Problem*, and *Mode* in which the error occurred.

Refer to Section II in the service manual for troubleshooting information.

ISA112500

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MIDMARK